


LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A lens unit, comprising:

a plurality of lens frames for holding an imaging optical system, said plurality of lens frames ~~lying~~ being located in a lens barrel and moving over a stowage interval between a position of stowage at which said lens frames are stowed and a ready-to-image position at which imaging is enabled, and over a zoom interval over which the ready-to-image position exists and a power varying action is executed;

a stepping motor for moving said plurality of lens frames, said lens unit being free of any encoder that detects the positions of the lens frames; and

 a driving control means for driving and controlling said stepping motor in a first driving mode during execution of a thrusting action for moving said plurality of lens frames from said position of stowage to said ready-to-image position or execution of a stowing action for moving said lens frames from any position within said zoom interval to said position of stowage, and for driving and controlling said stepping motor in a second driving mode, in which a lower current is used than in the first driving mode, during execution of a zooming action for moving said lens frames over said zoom interval.

2. (Original) A lens unit according to claim 1, wherein said driving control means drives and controls said stepping motor according to a two-phase excitation method in said first driving mode and according to a single/two-phase excitation or micro-step driving method in said second driving mode.

3. (Currently Amended) An electronic camera having an electronic imaging means for photoelectrically converting an object image formed by an imaging optical system and thus producing an image signal, an image processing means for performing predetermined processing on the image signal produced by said electronic imaging means and thus converting the image signal into a predetermined form, and a recording means for recording an output of said image processing means as image data, said electronic camera comprising:

a plurality of lens frames for holding said imaging optical system, said plurality of lens frames lying in a lens barrel and moving over a stowage interval between a position of stowage at which said lens frames are stowed and a ready-to-image position at which imaging is enabled, and over a zoom interval over which said ready-to-image position exists and a power varying action is executed;

a stepping motor for moving said plurality of lens frames, said electronic camera being free of any encoder that detects the positions of the lens frames; and

a conveying means for conveying a driving force produced by said stepping motor to said lens frames; and

a driving control means for driving mode during execution of a thrusting action for moving said plurality of lens frames from said position of stowage to said ready-to-image position or execution of a stowing action for moving said lens frames from any position within said zoom interval to said position of stowage, and for driving and controlling said stepping motor in a second driving mode, in which a lower current is used than in said first driving mode, during execution of a zooming action for moving said lens frames over said zoom interval.

4. (Original) An electronic camera according to claim 3, wherein said driving control means drives and controls said stepping motor according to a two-phase excitation method in said first driving mode and according to a single/two-phase excitation or micro-step driving method in said second driving mode.

5. (Original) An electronic camera according to claim 3, further comprising a control means for giving control so that power will not be supplied to said electronic imaging means during execution of a thrusting action or stowing action for thrusting or stowing said lens frames.

6. (Original) An electronic camera according to claim 5, wherein said driving control means drives and controls said stepping motor using a higher driving voltage in said first driving mode than in said second driving mode.

7. **(Withdrawn)** An electronic camera having an electronic imaging means for photoelectrically converting an object image formed by an imaging optical system and thus producing an image signal, an image processing means for performing predetermined processing on the image signal produced by said electronic imaging means and thus converting the image signal into a predetermined form, and a recording means for recording an output of said image processing means as image data, said electronic camera comprising:

a plurality of lens frames for holding said imaging optical system, said plurality of lens frames lying in a lens barrel and having at least one lens frame thereof driven to advance or withdrawn beyond the front surface of a camera body;

a stepping motor driven with pulses, for moving said plurality of lens frames;

a conveying means for conveying a driving force produced by said stepping motor to said lens frames;

a control means for driving and controlling said stepping motor so as to control the positions of said lens frames; and

a plurality of position detecting means for detecting the positions of zooming of said lens frames.

8. **(Withdrawn)** An electronic camera according to claim 7, wherein said conveying means is a cam member, and said plurality of position detecting means detects the displacement of said cam member to detect the positions of zooming of said lens frames.

9. **(Withdrawn)** An electronic camera according to claim 7 or 8, further comprising a calculating means for calculating information of a position of zooming from driving pulses applied to drive said stepping motor, and a correcting means for correcting the information of the position of zooming calculated by said calculating means according to outputs of said plurality of position detecting means during execution of a zooming action.

10. **(Withdrawn)** An electronic camera according to claim 8, wherein said cam member is a cam cylinder having a cam groove cut in the circumference of a cylindrical portion thereof, and said plurality of position detecting means is arranged in a circumferential direction on the circumference of the cylindrical portion of said cam cylinder.

11. (Original) A lens unit according to claim 2, wherein said driving control means drives and controls said stepping motor using a higher driving frequency in said first driving mode than in said second driving mode.

12. (Original) An electronic camera according to claim 4, wherein said driving control means drives and controls said stepping motor using a higher driving frequency in said first driving mode than in said second driving mode.

13. (Currently Amended) A lens unit, comprising:
a plurality of lens frames for holding an imaging optical system, said plurality of lens frames lying in a lens barrel and moving over a stowage interval between a position of stowage at which said lens frames are stowed and a ready-to-image position at which imaging is enabled, and over a zoom interval over which the ready-to-image position exists and a power varying action is executed;
a stepping motor for moving said plurality of lens frames; and
a driving control means for driving and controlling said stepping motor in a first driving mode during execution of a thrusting action for moving said plurality of lens frames from said position of stowage to said ready-to-image position or execution of a stowing action for moving said lens frames from any position within said zoom interval to said position of stowage, and for driving and controlling said stepping motor in a second driving mode, in which a lower current is used than in the first driving mode, during execution of a zooming action for moving said lens frames over said zoom interval,
wherein said driving control means drives and controls said stepping motor according to a two-phase excitation method in said first driving mode and according to a single/two-phase excitation or micro-step driving method in said second driving mode, and
~~A lens unit according to claim 2,~~ wherein said driving control means drives and controls said stepping motor according to ~~a~~ said two-phase excitation method when the power supply is turned off.

14. (Currently Amended) An electronic camera having an electronic imaging means for photoelectrically converting an object image formed by an imaging optical system and thus

producing an image signal, an image processing means for performing predetermined processing on the image signal produced by said electronic imaging means and thus converting the image signal into a predetermined form, and a recording means for recording an output of said image processing means as image data, said electronic camera comprising:

a plurality of lens frames for holding said imaging optical system, said plurality of lens frames lying in a lens barrel and moving over a stowage interval between a position of stowage at which said lens frames are stowed and a ready-to-image position at which imaging is enabled, and over a zoom interval over which said ready-to-image position exists and a power varying action is executed;

a stepping motor for moving said plurality of lens frames;

a conveying means for conveying a driving force produced by said stepping motor to said lens frames; and

a driving control means for driving mode during execution of a thrusting action for moving said plurality of lens frames from said position of stowage to said ready-to-image position or execution of a stowing action for moving said lens frames from any position within said zoom interval to said position of stowage, and for driving and controlling said stepping motor in a second driving mode, in which a lower current is used than in said first driving mode, during execution of a zooming action for moving said lens frames over said zoom interval,

wherein said driving control means drives and controls said stepping motor according to a two-phase excitation method in said first driving mode and according to a single/two-phase excitation or micro-step driving method in said second driving mode, and

An electronic camera according to claim 4, wherein said driving control means drives and controls said stepping motor according to a said two-phase excitation method when the power supply is turned off.

15. (Currently Amended) An electronic camera having an electronic imaging means for photoelectrically converting an object image formed by an imaging optical system and thus producing an image signal, an image processing means for performing predetermined processing on the image signal produced by said electronic imaging means and thus converting the image signal into a predetermined form, and a recording means for recording an output of said image processing means as image data, said electronic camera comprising:

a plurality of lens frames for holding said imaging optical system, said plurality of lens frames lying in a lens barrel and moving over a stowage interval between a position of stowage at which said lens frames are stowed and a ready-to-image position at which imaging is enabled, and over a zoom interval over which said ready-to-image position exists and a power varying action is executed;

a stepping motor for moving said plurality of lens frames, said electronic camera being free of any encoder that detects the positions of the lens frames; and

a conveying means for conveying a driving force produced by said stepping motor to said lens frames; and

a driving control means for driving and controlling said stepping motor in a first driving mode during execution of a thrusting action for moving said plurality of lens frames from said position of stowage to said ready-to-image position, execution of a stowing action for moving said lens frames from any position within said zoom interval to said position of stowage, or execution of a still picture imaging action, and for driving and controlling said stepping motor in a second driving mode, in which a lower current is used than in said first driving mode, during execution of a zooming action for moving said lens frames over said zoom interval or execution of a motion picture imaging action.

16. (Original) An electronic camera according to claim 15, wherein said driving control means drives and controls said stepping motor according to a two-phase excitation method in said first driving mode and according to a single/two-phase excitation or micro-step driving method in said second driving mode.

17. (Original) An electronic camera according to claim 15, wherein said driving control means drives and controls said stepping motor according to a single/two-phase excitation method in said first driving mode and according to a micro-step driving method in said second driving mode.


18. (Withdrawn) An electronic camera having an electronic imaging means for photoelectrically converting an object image formed by an imaging optical system and thus producing an image signal, an image processing means for performing predetermined processing

on the image signal produced by said electronic imaging means and thus converting the image signal into a predetermined form, and a recording means for recording an output of said image processing means as motion picture data or still picture data, said electronic camera comprising:

a plurality of lens frames for holding said imaging optical system, said plurality of lens frames lying in a lens barrel and moving over a stowage at which said lens frames are stowed and a ready-to-image position at which imaging is enabled, and over a zoom interval over which said ready-to-image position exists and a power varying action is executed;

a stepping motor for moving said plurality of lens frames;

a conveying means for conveying a driving force produced by said stepping motor to said lens frames;

 a driving control means for driving and controlling said stepping motor in a first driving mode during execution of a still picture imaging action, and for driving and controlling said stepping motor in a second driving mode, in which a lower current is used than in said first driving mode, during execution of a motion picture imaging action.

19. (Withdrawn) An electronic camera according to claim 18, wherein said driving control means drives and controls said stepping motor according to a two-phase excitation method in said first driving mode and according to a single/two-phase excitation or micro-step driving method in said second driving mode.

20. (Withdrawn) An electronic camera according to claim 18, wherein said driving control means drives and controls said stepping motor according to a single/two-phase excitation method in said first driving mode and according to a micro-step driving method in said second driving mode.
